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EXAMINER

BUTLER, PATRICK NEAL

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1791

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |   |  |
|------------------------------|--------------------------------------|---|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>09/889,113 | <b>Applicant(s)</b><br>MOCHIZUKI ET AL. |  |
|                              | <b>Examiner</b><br>Patrick Butler    | <b>Art Unit</b><br>1791                 |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 May 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 15-19,21,22,24 and 29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-19,21,22,24 and 29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 15-19, 21, 22, 24, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto (EP 1033422A1) in view of Rowan et al. (US Patent No. 4,851,172) and Toshio et al. (Japanese Patent Publication No. JP 52066769 A).

With respect to Claim 15, Fujimoto teaches a method of producing a poly(trimethylene terephthalate) fiber where the yarn is drawn, heat treated and then subjected to a relaxation treatment (a polymer substantially comprising polytrimethylene terephthalate) [0035]. The intrinsic viscosity of the polymer is 0.4 – 1.5, preferably 0.7 – 1.2 (intrinsic viscosity at least 0.7) [0016]. In the process, the multifilaments are extruded from a spinning machine (method of producing multifilament yarn; melt spun) [0035] and wound round a first roll heated at 30 – 80 °C and then a second heated roll at 100 to 160 °C (hauled-off via a first heated roll; second heated roll; continuously subjected to a heat-treatment at the second roll and a relaxation heat treatment; the second heated roll at 105-180 °C) [0038]. The multifilaments are wound around a first roll at a speed of 300-3,500 m/min (at a spinning rate of at least 2,000 m/min.) ([0036] and [0037]), drawn by a second roll at a ratio of 1.3 to 4 (without winding, subjected to drawing performed between the first heated roll and a second roll at low draw rate)

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[0038], wound round the second roll (by plural laps of the yarn) [0036], relaxed at a ratio of 0.8-0.999, with the ratio being the winding speed/peripheral speed of the second roll (at a relaxation factor of 10-20% between the second heated roll and a winder) [0040], mixed by methods such as interlacing before incorporating the yarn into fabric (after which it is continuously subjected to an interlacing treatment) [0045], and wound up on a winder (and wound up as a package) [0036].

“[B]y employing the heat of a second heated roller... a relaxation heat treatment is carried out” (see Applicant’s Specification, page 13, lines 12-30). Thus, Applicant’s Specification clarifies that a heat treatment at a second roll is inherently sufficient to provide a relaxation heat treatment between the second heated roll and a third roll or between the second heated roll and a winder. Such inherency is supported by the heat of the roller transferring to the wrapped yarn which then leaves the roller and continuing its heat treatment until it cools.

Fujimoto fails to teach that the second heated roll used for the relaxation treatment has a surface roughness of 1.5 S – 8 S as required by claim 15.

Rowan is directed to a process for high speed, multi-end polyester yarn (Title). Rowan teaches manufacturing a multi-filament yarn by extruding, passing the filaments through drawing rolls, then through relaxing rolls, and then finally through a conventional air interlacing jet and then wound up (columns 2 and 3). The surface finish ( $R_a$ ) value for the rolls other than the first encountered roll can be between 35 and 120 microinches (0.89 – 3.0 micrometers) (column 4, lines 10 – 20). On page 14 of Applicant’s Specification, Applicant indicates that 1.5S – 8S is equivalent to 0.8 – 6.3

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micrometers as required by claims 15. Rowan suggests that the use of matte rollers produce a yarn with excellent mechanical qualities (column 4, lines 25 – 40).

Rowan does not appear to explicitly teach that  $R_{\max}$  of the  $R_a$  is within the claimed range (e.g.,  $1.5S - 8S$ ).

However, in this regard, Rowan teaches this value for  $R_a$  as previously described as well as making the surface smooth, which would minimize the variation in the surface (see col. 5, line 4). As such, Rowan recognizes that the respective  $R_{\max}$  is a result-effective variable. Since  $R_{\max}$  is a result-effective variable, one of ordinary skill in the art would have obviously been motivated to determine the optimum  $R_{\max}$  applied in the process of Rowan through routine experimentation based upon minimizing the variation in  $R_a$  to achieve a smooth surface (see col. 5, line 4).

Since Fujimoto lacks disclosure to specific details about the surface roughness of the second heated roller, it would have been necessary and thus obvious for one of ordinary skill in the art practicing the invention of Fujimoto to look to the prior art as exemplified by Rowan to provide the details of the relaxation roller's surface texture. As heated matte rollers having a temperature of at least  $140^{\circ}\text{C}$  and a surface finish value of  $0.89 - 3.0$  micrometers which has a relaxation between  $1 - 10$  percent produces a yarn with excellent mechanical qualities (see Rowan, col. 4, lines 33-35), it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the heated matte finish relaxation rollers of Rowan in the invention of Fujimoto, motivated by the expectation of successfully practicing the invention of Fujimoto.

Fujimoto fails to expressly teach intermingling to a specific CF value.

Toshio teaches interlacing to a CF value of 10-100 with a synthetic multifilament fiber (Abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Toshio's CF value with Fujimoto's process of making filaments and intermingling in order to manufacture a sizeless, twistless fabric (see Toshio) and to give a fabric thus obtained excellent softness, stretchability properties, and color developing properties (see Fujimoto [0044]).

Fujimoto discloses the claimed invention of interlacing before incorporating the formed yarn into fabric [0045] except for expressly teaching that the interlacing is before winding. It would have been obvious to one having ordinary skill in the art at the time the invention was made to interlace is before winding, since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. *In re Einstein*, 8 USPQ 167.

Fujimoto in view of Rowan and Toshio teach that the breaking extension of the yarn is 40% or more, the strength from a stress-strain curve of at least 3 cN/dtex, a Young's modulus of no more than 25 cN/dtex, a minimum value of a differential Young's modulus at 3-10% elongation of no more than 6.6 CN/dtex, and an elastic recovery following 10% elongation of at least 90% principally because they teach the same claimed process.

With respect to Claim 16, Fujimoto teaches that the intrinsic viscosity of the polymer is 0.4 – 1.5, preferably 0.7 – 1.2 (intrinsic viscosity at least 0.8) [0016].

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As to claim 17, Fujimoto teaches that multifilaments are extruded from a spinning machine at a temperature from 250 – 290 °C [0033], which is 22 – 62°C higher than the melt temperature.

As to claims 18, Fujimoto teaches that the fibers are drawn on the first roll heated at 30 – 80 °C having a peripheral speed of 300 to 3,500 m/min without winding thereon (>3,000 m/min.) [0035].

As to claim 19, Fujimoto teaches in Example 13 that the relaxation ratio is 0.88 (see Table 1 continued, Example 13), which is equivalent to a relaxation factor of 12%.

With respect to Claim 21, Rowan teaches that the surface finish value for the rolls can be between 35 and 120 microinches (0.89 – 3.0 micrometers) (column 4, lines 10 – 20). On page 14 of Applicant's Specification, Applicant indicates that 1.5S – 8S is equivalent to 0.8 – 6.3 micrometers as required by claims 21 (3.2 S – 6.3 S).

With respect to Claim 22, the draw temperature is -15 – 35 °C higher (10-50 °C higher) than the glass transition temperature of poly (trimethylene terephthalate), which is 45 °C.

As to claim 23, Fujimoto teaches that the fibers have the relaxation heat treatment performed on the second and third rolls at temperatures 100 – 160 °C and 120 – 150 °C respectively (page 8, lines 25 – 55).

As to claim 24, Fujimoto teaches that the draw ratio can be 2.20 in Example 13. The Examiner considers a draw ratio of 2.20 to be a "low" draw rate as required by Applicant. Fujimoto in view of Rowan and Toshio teach having strength from a

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stress/strain curve of at least 3cN/dtex and a breaking extension of at least 42% principally because they teach the same claimed process.

As to Claim 29, Fukimoto as combined with Rowan teaches the claimed surface roughness of 1-5S and 8S as previously described. Fukimoto also teaches that the second heated roll is at 100 to 160 °C (the second heated roll at 105-180 °C) [0038].

The claimed effect of reducing the frictional coefficient between the yarn and the second heated roll to cause a desired amount of slip so that there is no winding of the yarn back onto the second heated roll at a high relaxation factor is achieved by Fukimoto in view of Rowan principally because it is explicitly claimed to result from the roughness and temperature of the second heated roll taught Fukimoto in view Rowan.

Thus, the examiner recognizes that all of the claimed effects and physical properties are not positively stated by the reference(s). Note however that the references teach all of the claimed ingredients, process steps and process conditions and thus, the claimed effects and physical properties would necessarily be achieved by carrying out the disclosed process. If it is applicants' position that this would not be the case: (1) evidence would need to be presented to support applicants' position; and (2) it would be the examiner's position that the application contains inadequate disclosure in that there is no teaching as to how to obtain the claimed properties and effects by carrying out only these steps.

### ***Response to Arguments***

Applicant's arguments filed 08 May 2008 have been fully considered but they are not persuasive.



Applicant argues with respect to the 35 USC § 112, first paragraph, rejections.

Applicant's arguments appear to be on the grounds that:

1) The deleted claimed subject matter obviates the 35 USC § 112, first paragraph, rejections.

Applicant argues with respect to the 35 USC 103(a) rejections. Applicant's arguments appear to be on the grounds that:

2) The invention includes the combination of heat treatment and roughness of the second roller as claimed. This combination causes reduced frictional coefficient and increased slip between the yarn and the roller. Such effects are evidenced by Applicant's Specification, page 14, line 29 through the top of page 15.

3) Fujimoto does not teach the use of a heated roll with a surface roughness.

4) Fukimoto does not teach a relaxation heat treatment at a high relaxation factor or 10-20% at a high spinning rate of at least 2,000 m/min.

5) Rowan's surface finish values are directed to relaxation alone rather than deliberately introducing an amount of slip so that there is no winding of the yarn back onto the particular roll.

The Applicant's arguments are addressed as follows:

1) In view of Applicant's amendment of Claim 15, the Examiner withdraws the previously set forth 35 USC § 112, first paragraph, rejections as detailed in the Claim Rejections - 35 USC § 112 section of the Office Action dated 11 January 2008.

2) Applicant's arguments with respect to the unexpected results of reduced frictional coefficient and increased slip between the yarn and the roller have been considered, but they are not persuasive:

A) The Specification's discussion does not appear to be commensurate in scope with the Claim. The Specification's result of reduced frictional coefficient and increased slip between the yarn and the roller only prefers the Claimed surface roughness, which indications achieving sufficient slip for relaxation heat treatment outside the claimed range. Similarly, the Specification discusses a "high relaxation factor" rather than the claimed relaxation factor.

B) No tests show that the criticality of the claimed range. To establish unexpected results over a claimed range, applicants should compare a sufficient number of tests both inside and outside the claimed range to show the criticality of the claimed range. *In re Hill*, 284 F.2d 955, 128 USPQ 197 (CCPA 1960).

2) Moreover, as combined above, Fujimoto in view of Rowan and Toshio teach the claimed process limitations.

3) As recited above, Rowan is relied upon to teach the claimed surface roughness.

4) As recited above, Fujimoto teaches the multifilaments are wound around a first roll at a speed of 300-3,500 m/min (at a spinning rate of at least 2,000 m/min.) ([0036] and [0037]) and relaxed at a ratio of 0.8-0.999, with the ratio being the winding speed/peripheral speed of the second roll (at a relaxation factor of 10-20% between the second heated roll and a winder) [0040].

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5) As recited above with respect to Claim 29's claimed properties of the second roll:

Fukimoto as combined with Rowan teaches the claimed surface roughness of 1-5S and 8S as previously described. Fukimoto also teaches that the second heated roll is at 100 to 160 °C (the second heated roll at 105-180 °C) [0038].

The claimed effect of reducing the frictional coefficient between the yarn and the second heated roll to cause a desired amount of slip so that there is no winding of the yarn back onto the second heated roll at a high relaxation factor is achieved by Fukimoto in view of Rowan principally because it is explicitly claimed to result from the roughness and temperature of the second heated roll taught Fukimoto in view Rowan.

Thus, the examiner recognizes that all of the claimed effects and physical properties are not positively stated by the reference(s). Note however that the references teach all of the claimed ingredients, process steps and process conditions and thus, the claimed effects and physical properties would necessarily be achieved by carrying out the disclosed process. If it is applicants' position that this would not be the case: (1) evidence would need to be presented to support applicants' position; and (2) it would be the examiner's position that the application contains inadequate disclosure in that there is no teaching as to how to obtain the claimed properties and effects by carrying out only these steps.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Butler whose telephone number is (571) 272-8517. The examiner can normally be reached on Mon.-Thu. 7:30 a.m.-5 p.m. and alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/P. B./

Examiner, Art Unit 1791

/Monica A Huson/

Primary Examiner, Art Unit 1791